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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,106	02/01/2001	Gerard A. Mourou	UMJ-939-R	4544

7590

07/17/2002

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EXAMINER

EVANS, GEOFFREY S

ART UNIT	PAPER NUMBER
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1725

12

DATE MAILED: 07/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/775,106

Applicant(s)

MOUROU ET AL.

Examiner

Geoffrey S Evans

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 April 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 46-80 is/are pending in the application.
- 4a) Of the above claim(s)        is/are withdrawn from consideration.
- 5) ☐ Claim(s)        is/are allowed.
- 6) ☒ Claim(s) 46-80 is/are rejected.
- 7) ☐ Claim(s)        is/are objected to.
- 8) ☐ Claim(s)        are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on        is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on        is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No.       .
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s).
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5,6,10. 6) ☐ Other:

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### DETAILED ACTION

1. The first sentence of the specification should be amended to refer to all of the other reissue applications (including 09/775,069) in accordance with 37 CFR 1.777(a). Please also note that current application is a reissue of U.S. Patent No. 5,656,186 since this application was copending with 09/366,685 (now US RE37,585 E).
2. The original patent, or a statement as to loss or inaccessibility of the original patent, must be received before this reissue application can be allowed. See 37 CFR 1.178. Although applicant has surrendered this patent in the previous reissue application, applicant needs to include a statement in this file that U.S. Patent No. 5,656,186 was previously surrendered in application No. 09/366,685.
3. In accordance with 37 CFR 1.175(b)(1), a supplemental reissue oath/declaration under 37 CFR 1.175(b)(1) must be received before this reissue application can be allowed.

Claims 46-80 are rejected as being based upon a defective reissue declaration under 35 U.S.C. 251. See 37 CFR 1.175. The nature of the defect is set forth above.

Receipt of an appropriate supplemental oath/declaration under 37 CFR 1.175(b)(1) will overcome this rejection under 35 U.S.C. 251. An example of acceptable language to be used in the supplemental oath/declaration is as follows:

"Every error in the patent which was corrected in the present reissue application, and is not covered by a prior oath/declaration submitted in this application, arose without any deceptive intention on the part of the applicant."

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4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 46-49,50,51,51,55,56-67,69-78,80 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-51 of U.S. RE37,585E. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in Mourou et al. (585E) disclose machining with a pulse width of the width characterized by breakdown of the relationship between the fluence threshold and a distinct change in slope, which is a pulse width that is less than the pulse width at which the ablation becomes "essentially accurate".

6. Claims 46,47,50, 53,54,55,56,61,63,67,68,69, 78,79,80 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Acronyms such as "LIB" should not be used in the claims.

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7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 46,48,49,50,51/46,51/48,51/49, 51/50,57/46,57/48, 57/49,57/50, 58/46,58/48, 58/49,58/50,59/56/46,59/56/47,59/56/48,59/56/50, 6 -63 are rejected under 35 U.S.C. 102(b) as being anticipated by Ihlemann et al. in the article "Nanosecond and Femtosecond Excimer Laser Ablation of Fused Silica". Ihlemann et al. discloses as shown in figure 1 laser ablation of a transparent material ( $\text{SiO}_2$ ) by making holes with pulses of 500 femtoseconds duration, which is far less than a pulse width of 10 picoseconds which is disclosed as the point at which the machining is essentially accurate with this material. Since Ihlemann et al. discloses pulse width shorter than 10 picoseconds inherently under Applicant's discovered law of nature (the log-log relationship between fluence threshold at which breakdown occurs versus laser pulse width, the relationship exhibiting a distinct change in slope with respect to decreasing pulse width to a nearly constant value) the laser pulse ablation of Ihlemann et al. must also be subject to the same law of nature. See EMI Group North America Inc. v. Cypress Semiconductor Corp., 60 USPQ 1423,1430 (CAFC 2001) which states

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"Recitation of a law of nature does not distinguish a claim from prior art. Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127,130 (1948) ("[M]anifestations of laws of nature [are] free to all men and reserved exclusively to none. He who discovers a hitherto unknown phenomenon of nature has no claim to monopoly of it which the law recognizes.")". Similarly, Ihlemann et al.'s pulse width must be below the pulse width at which the laser induced breakdown becomes essentially accurate and the point at which the size of the feature is not limited by thermal diffusion and the pulse width of Ihlemann is sufficiently short that the affected area is substantially determined solely by the beam shape and fluence in relation to the threshold for laser induced breakdown.

9. Claim 47 is rejected under 35 U.S.C. 102(b) as being anticipated by Maillot et al. in U.S. Patent No. 5,659,536. Maillot et al. discloses as shown in figure 1 using a pulsed laser beam with a wavelength that is larger than the area whose "properties" are changed by the beam. (Claim 47 does not restrict the pulse width of the laser beam).

10. Claims 46,48,49,50,51/46,51/48,51/49/51/50, 52/46, 52/48,52/49,52/50,55/46, 55/48,55/49,55/50, 57/46,57/48,57/49,57/50,58/57/46,58/57/48,58/57/49,58/57/50, 62/55/46,62/55/48,62/55/49,62/55/50,63/46,63/48,63/49,63/50, 65/46,65/48,65/49, 65/50,66/46, 66/48, 66/49, 66/50, 69/46,69/48,69/49,69/50,70/46,70/48,70/49,70/50, 71/46,71/48, 71/49, 71/50, 72/46,72/48,72/49,72/50, 73/46,73/48,73/49,73/50, and 78 are rejected under 35 U.S.C. 102(a) as being anticipated by Kautek et al. in the article of "Femtosecond pulse laser ablation of metallic, semiconducting, ceramic, and biological materials", (Kautek et al. has a publication date of April 5,1994 3 days before Applicant's filing date). Kautek et al. discloses using laser pulses of 300 femtoseconds

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to ablate gold with a focus diameter of 50 microns, a pulse repetition rate of 3 Hz, a scanning speed of .5 microns/second, and a single pulse energy of 200 microjoules (see page 601 and figures 3 and 4 of the article). Since Kautek et al. discloses pulse width shorter than 10 picoseconds inherently under Applicant's discovered law of nature (the log-log relationship between fluence threshold at which breakdown occurs versus laser pulse width, the relationship exhibiting a distinct change in slope with respect to decreasing pulse width to a nearly constant value) the laser pulse ablation of Kautek et al. must also be subject to the same law of nature. See EMI Group North America Inc. v. Cypress Semiconductor Corp., 60 USPQ 1423,1430 (CAFC 2001) which states "Recitation of a law of nature does not distinguish a claim from prior art. Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127,130 (1948) ("[M]anifestations of laws of nature [are] free to all men and reserved exclusively to none. He who discovers a hitherto unknown phenomenon of nature has no claim to monopoly of it which the law recognizes.")".

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

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the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 47,51/47,52/47,55/47,56,59,60,61, 58/47,62/55/47,63/47,65/47, 66/47,69/47, 70/47, 71/47,72/47,73/47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ihlemann et al. in view of Lai in U.S. Patent No. 5,984,616. Ihlemann et al. discloses as shown in figure 1 laser ablation of a transparent material ( $\text{SiO}_2$ ) by making holes with pulses of 500 femtoseconds duration. Lai as shown in figure 5 creates an interaction zone that is smaller than the wavelength of the laser beneath the surface of the workpiece. It would have been obvious to adapt Ihlemann et al. in view of Lai to provide this to decrease the size of the part of the workpiece that has its material properties change.

14. Claims 47,51/47,52/47,55/47,56,59,60,61 57/47,58/57/47,62/55/47, 63/47,65/47,66/47,69/47, 70/47,71/47,72/47,73/47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kautek et al. in the article of "Femtosecond pulse laser ablation of metallic, semiconducting, ceramic, and biological materials" in view of Lai in U.S. Patent No. 5,984,616. Lai as shown in figure 5 creates an interaction zone that is smaller than the wavelength of the laser beneath the surface of the workpiece. It would have been obvious to adapt Kautek et al. in view of Lai to provide this to decrease the



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size of the part of the workpiece that has its material properties change and to induce laser induced breakdown beneath the surface of the workpiece.

15. Claims 64/46,64/48,64/49,64/50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ihlemann et al. in view of Mourou et al. in U.S. Patent No. 5,235,606. Mourou et al. teaches generating a short optical pulse by stretching the pulse in time, amplifying the pulse, and recompressing the amplified pulse. It would have been obvious to adapt Ihlemann et al. in view of Mourou et al. to provide this to create a short high peak power pulse.

16. Claim 64/47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ihlemann et al. in view of Lai in U.S. Patent No. 5,984,916 as applied to claim 47 above, and further in view of Mourou et al. in U.S. Patent No. 5,235,606. Mourou et al. teaches generating a short optical pulse by stretching the pulse in time, amplifying the pulse, and recompressing the amplified pulse. It would have been obvious to adapt Ihlemann et al. in view of Lai and Mourou et al. to provide this to create a short high peak power pulse.

17. Claims 53/46,53/48, 53/49, 53/50, 54/53/46, 54/53/48, 54/53/49, 54/53,50, 68/46,68/48,68/49,68/50, 79, and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kautek et al. in view of Wojnarowski et al. in U.S. Patent No. 5,104,480. Wojnarowski et al. teaches laser machining gold (see column 7, line 19) above a substrate of glass (see column 6, line 64) to create a conductive pattern for an integrated circuit. It would have been obvious to adapt Kautek et al. in view of Wojnarowski et al. to provide this to create an integrated circuit on a substrate.

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18. Claims 53/47, 54/53/47, 68/47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kautek et al. in view of Lai as applied to claim 47 above, and further in view of Wojnarowski et al. in U.S. Patent No. 5,104,480. Wojnarowski et al. teaches laser machining gold (see column 7, line 19) above a substrate of glass (see column 6, line 64) to create a conductive pattern for an integrated circuit. It would have been obvious to adapt Kautek et al. in view of Wojnarowski et al. to provide this to create an integrated circuit on a substrate.

19.

Claims 46-80 are rejected under 35 U.S.C. 251 as being an improper recapture of broadened claimed subject matter surrendered in the application for the patent upon which the present reissue is based. See *Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998); *In re Clement*, 131 F.3d 1464, 45 USPQ2d 1161 (Fed. Cir. 1997); *Ball Corp. v. United States*, 729 F.2d 1429, 1436, 221 USPQ 289, 295 (Fed. Cir. 1984). A broadening aspect is present in the reissue which was not present in the application for patent. The record of the application for the patent shows that the broadening aspect (in the reissue) relates to subject matter that applicant previously surrendered during the prosecution of the application. Accordingly, the narrow scope of the claims in the patent was not an error within the meaning of 35 U.S.C. 251, and the broader scope surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application.

During the prosecution of U.S. Patent No. 5,656,186, (U.S. Application Serial No. 08/224,961) in reply to the rejection of August 10, 1995 the amendment of December

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4,1995 (which amended the claims by changing "predetermined" to "characterized") on page 10, lines 21-23 argues that "Miyauchi does not employ pulse widths that are less than the 'characteristic pulse width' as defined in claim 1 as now amended." Since the preamble of claim 1 in 08/224,961 recites that "the material being characterized by a relationship of fluence breakdown threshold versus laser pulse width having a rapid and distinct change in slope" to not have this limitation in the claims of the instant reissue (other than independent claim 49 and claims that depend upon claim 49) would be an improper recapture of subject matter previously surrendered during the prosecution of 08/224,961. Only independent claim 49 (which is similar to claim 36 of U.S. Patent No. 5,656,186) should recite a characterized pulse width with a relationship of fluence breakdown threshold versus laser pulse width having a distinct change in slope. The other independent claims need to characterize a pulse width by a relationship of fluence breakdown threshold versus laser pulse width having a rapid and distinct change in slope.


20. Claims 67-77 patentably define over the art of record but are rejected under 35 U.S.C. 251 as stated above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Geoffrey S Evans whose telephone number is (703)-308-1653. The examiner can normally be reached on Mon-Fri 6:30AM to 4:00 PM, alternate Fridays off. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703)-308-3318. The fax

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phone numbers for the organization where this application or proceeding is assigned are (703)-872-9310 for regular communications .

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0661.



Geoffrey S Evans  
Primary Examiner  
Art Unit 1725

GSE  
July 8, 2002